

10 Barge Costs

- Ocean Tugboats of 3,000 – 5,000 – 7,000 horsepower
- Ocean Barges of 189 – 300 – 420 – 600 – 640 FEU
- Port wharfage of \$40 – \$110 – \$150 FEU
- #2 Diesel of \$1.20 per gallon
- Tug-Barge speeds of 7 – 8 – 9 – 11 – 12 knots

Barge costs for this model will be time charter by the shipper's association on terms of "Free in and out" (FIO). According to The Transportation Institute the term time charter means "A form of charter party wherein owner lets or leases his vessel and crew to the charterer for a stipulated period of time. The charterer pays for the bunkers and port charges in addition to the charter hire. Therefore the shipper's association and the barge owner will negotiate the charter party i.e. "A contractual agreement between a ship owner and a cargo owner, usually arranged by a broker, whereby a ship is chartered (hired) whether for one voyage or a period of time." The barge owner will be responsible for operating costs from port to port and the shipper's association will pay for port dockage (\$2,800 for a 200 meter/650' barge is used) and loading and unloading of the barge.

On source of barge costs is the Planning Guidance Shallow Draft Vessel Costs published by the U.S. Army Corps of Engineers, Institute for Water Resources. The FY 2004 is soon due out, the data used herein is from the last published in FY 2000 with updated fuel costs of #2 diesel at \$1.20 per gallon. A 5000-6000 horsepower tugboat at a replacement cost of \$6.5 million would have a daily estimated high power use cost of \$11,686 with fuel consumption at 0.905 gallons per horsepower per 24-hour day and an estimated in port cost of \$6,686 per day. A 7000-8000 horsepower tugboat at a replacement cost of \$9 million would have a daily estimated high power use cost of \$15,150 with fuel consumption at 0.905 gallons per horsepower per 24 hour day and an estimated in-port cost of \$7,924 per day.

The highest barge cost in the data has a replacement cost of \$4.35 million at a daily cost of \$1,685. Barge operators in the PNW have used a value of \$2,000 per day for existing ocean barges of 400' by 100'. This model will use \$2,000 per day; except a new 565' long, 84' breadth by 18' depth with no more than 14' loaded draft. Construction cost is estimated at \$10 million with 10% loan for 15 years with 25 percent owner margin for maintenance and profit. Value used in model is \$4,500 per day. The new barge is modeled at 9 knots, although new barge design (hydro-lift skegs) has permitted tug-barge speed to reach 11 knots with the right combination of tugboat.

For the 320 FEU on the 400' by 100' barge towed by a 5000 horsepower tug the transit time for 1000 miles would be 3.7 days at 10 knots. For costing we will use 5 days (8 knots) at \$11,686 and 2 days at \$6,686 per day plus the barge at \$2,000 per day for 7 days. Cost would be \$85,802 or \$268 per FEU. If we allow for a 10% slot reduction i.e. 32 containers did not sail, the cost would rise to \$298 per FEU.

Weather permitting, if a tandem tow could be used the calculation would be a 7000 horsepower tugboat at 5 days of \$15,150 and 2 days of \$7,924 for in port. Tandem barges would be \$4,000 at 7 days. Total would be \$119,598. Tandem barges would hold 600 to 640 FEU. Using 600 FEU the cost per FEU would be \$199. If 30% of the containers (180 FEU) did not make sailing then the cost per FEU would be \$285. Tandem tows have been reported being used between the West Coast and Hawaii. The fair weather seasonal use would reduce the FEU cost on average.

These figures are believed to be on the conservative side. The cost of construction of new tugboats and barges have been cited but initiation of barging on the West Coast will most likely be with existing equipment, hence the costs extracted from the IWR publication is believed to reflect a time charter cost.

It will be the responsibility of the shipper's association to maximize the number of containers on the sailing.

There are ATBs that can be placed in service in a short period of time. The capacity is expected to be 400 to 450 FEU. Since 11 knots is reasonable, even in seas to 18 feet, the time enroute for the 1000 miles would be 3.5 days. Time charter FIO terms would approximate \$18,000 per day and

fuel \$7,000 when running. Total cost would be \$125,500 for the voyage or \$314 per FEU.

These ATBs in the Gulf of Mexico service for fertilizer move 37,000 short tons from Tampa to New Orleans in 3 days sailing at a revenue of \$7 to \$10 per ton in competition with rail at a rate of \$14 per short ton. The conversion of this revenue to a time charter basis per FEU would be \$648, hence the reader can see the benefits of a shipper's association in a charter party, although there is risk to meeting full capacity of each sailing, the benefits can be a FEU rate at half of a contract rate.

An estimate for a new ATB capable of transiting the locks on the Columbia and Snake River System costing \$26 million (\$21 million for the 300 FEU barge and \$5 million for the 5,000 horsepower tugboat) would operate on a time charter of \$25,500 per day while running and \$20,000 while in port. While on the river the speed would be reduced and two days is anticipated from an inland port such as Boardman or Umatilla and the Pacific Ocean. The ocean in-transit time is at an expected 12 knots (the ATB would have a narrower breadth because of the locks and a lighter load of 300 FEU) would be 3 days for a total of 5 days plus 2 days loading and unloading. Total cost would be \$167,500 or \$558 per FEU. However, there would be for the voyage less \$250 in transit on traditional towboat and \$110 less in ocean port transfer cost. The economic benefits are shown in the cost model(s) section. If the ATB commences the voyage at the river ocean loading port then the transit time would be 3.5 days and 2 days of loading and unloading for a cost of \$431 per FEU. The total voyage cost via ATB would be less in both scenarios.

For an alternative route to Tacoma, WA, from Umatilla, OR, a distance of approximately 572 miles via the Columbia River and the Strait of Juan de Fuca using existing equipment of a deck barge 78' by 285' holding 189 FEU lashed 3 high and pulled by a tugboat of 3000 horsepower, the cost would be \$294 per FEU, with 10 percent of the containers missing the sailing, therefore 170 FEU, based on the following criteria. There is an operating barge company currently moving cargo from Coos Bay, OR to Long Beach, CA, a distance of approximately 812 miles or 180 miles per day or about 7 knots per hour. This would equate to the Tacoma, WA run at 3 days, however costs are calculated at 4 days enroute accounting for delays in lockage. Using IWR costs for a 2800-3200 horsepower tugboat and updating fuel consumption to 0.905 gallons per horsepower per 24

hours at \$1.20 per gallon and the barge at \$2,000 per day the total cost would be \$49,908. However, the locks can take a much larger ocean barge and yet have the channel depth to Umatilla, OR. A ocean deck barge of 84' by 565' with containers stacked 3 high to allow for vertical clearance pushed through the locks and pulled in open ocean by a 5000 horsepower tugboat would move 420 FEU; with 30 percent of the containers missing the sailing the FEU would be 294. The cost for the trip using the IWR costs and \$3,000 per day for the 565' barge would be \$78,116 or \$265 per FEU.

For a complete cost analysis of truck vs. barge, the container or trailer cost needs to be included. Private companies may opt to dray their container to the inland port for the voyage and receive their fleet container at destination port using their fleet tractors as the power unit instead of having a draying company deliver to their distribution center. There could be appropriate discounts for drayage and equipment use.

Another approach is to have captive containers (the standard FEU of 40' by 8' by 8' will be used although high cube containers of 9'6" are in common use in export/import). Leased 40' containers of a current value of \$3,400 are approximately \$2.25 per day or \$67.50 per month. The containers would cycle two loads per month, hence the lease cost of \$33.75 per load. For a 600 FEU weekly sailing, the total captive container need would be 2400. For example the loading, intransit and discharge time would be 5-7 days. The storage costs will be more reasonable when the cargo remains in the container at the port until drayed to off-port distribution center. A receiver, instead of a truckload delivery daily, would receive 7 days (7 containers) of product since there would initially be weekly sailings. On the day of arrival one container would be drayed to the receiver's facility off port and six containers would remain at the port. The next day another container would leave the port and so forth. Thus the containers would be discharged and available for reloading for the reverse sailing in 7 days. Captive containers are used in the Alaska trade.

The following port storage charges have been gathered as examples of anticipated costs and will be used in the model although West Coast port tariffs may provide for up to five days free storage [based on Port of Long Beach – Tariff No. 004 Rule 34-D, Section 4 . . . Free Time, Coastwise Trade, Inbound 5 days, Outbound 5 days, Exclusive of Saturday, Sunday and Holidays].

San Diego outside storage charges of \$0.14 per square foot of dock space per month, stacked three high and two wide for 6 days is \$1.92 per FEU.

Sacramento storage of \$0.33 per CWT per month is \$18.15 per FEU.

Stockton storage of \$0.28 per square foot per month is \$3.84 per FEU.

A public warehouse in Portland, Oregon suggested using \$0.45 per CWT per month is \$24.75 per FEU. Therefore the highest value will be used. There will be interest on the increased inventory intransit compared to two days via truck. Product will be from 5 to 7 days enroute including the drayage, loading and unloading time plus the storage time at destination port. Shown below is the container value at \$0.50 per pound of product. With lower interest rates during the writing of this report, ten percent is used.

Seven Containers of 55,000 pounds at \$0.50 per pound is \$192,500

7 days of interest for 385,000 pounds is \$369.08

1 day of interest for 330,000 pounds is \$45.19

1 day of interest for 275,000 pounds is \$37.66

1 day of interest for 220,000 pounds is \$30.13

1 day of interest for 165,000 pounds is \$22.60

1 day of interest for 110,000 pounds is \$15.06

1 day of interest for 55,000 pounds is \$7.53

The total interest would be \$527.25 or \$75.32 per FEU. This would be reduced by \$15.06 for the truck two days yielding a barge cost of \$60.26 FEU.

11 Environmental Costs of Trucks and Barges

The EU White Paper on European Transport Policy¹ defines external costs as costs connected with accidents, air pollution, noise and congestions. Air pollution includes cost to health and damaged crops, also included is climate change affecting floods and damaged crops. Noise is a cost to health. Accidents are medical costs and congestion is loss of time. These have been quantified as:

Table 2, page 71 External costs of a heavy goods vehicle traveling 100 km (60 miles) on a motor way with little traffic as measured in average range of Euros [presently a Euro is USD 1.205]

Air Pollution	Euros	2.3 – 15
Climate Change	Euros	0.2 – 1.54
Noise	Euros	0.7 – 4
Accidents	Euros	0.2 – 2.6
Congestion	Euros	2.7 – 9.3
Low End of Range	Euros 6.1	USD 7.35

For our model of 1000 miles these external costs, at the low end of the range, would amount to \$122.50 per truckload.

Interesting at page 24 is the statement that; “For instance, motorway maintenance would cost six times less if cars were the only vehicles to use the motorways.”

Concerning the cost of highway deaths and accidents, the White Paper at page 65: “In 2000, road accidents killed over 40,000 people in the European Union and injured more than 1.7 million The directly measurable cost of road accidents is of the order of Euros 45 billion. Indirect costs (including physical and psychological damage suffered by the victims and their families) are three to four times higher. The annual figure is put at Euros 160 billion.” [Euros 45 billion is USD 54 billion and Euros 160 billion is USD 193 billion.]

According to the USDOT NHTSA release of April 28, 2004 there were 43,220 deaths in 2003 on the nation’s highway. NHTSA estimates that

highway crashes cost society \$230 billion a year. Fatalities from large truck crashes in 2003 were 4,942.

Congestion costs in the U.S. have been quantified by the Victoria Transport Policy Institute. They define traffic congestion costs as incremental delay, driver stress, vehicle costs, crash risk and pollution resulting from interference between vehicles in the traffic stream, particularly as a roadway system approaches its capacity. They continue: “Larger and heavier vehicles cause more congestion than smaller, lighter vehicles because they require more road space and are slower to accelerate. The relative congestion impact of different vehicles is measured in terms of “Passenger Car Equivalents” or PCEs. Large trucks and buses tend to have 1.5-2.5 PCEs, depending on road way conditions ...”

In the report, a 1997 Federal highway Cost Allocation Study is cited which quantifies Urban Highway Congestion Costs for Combination Trucks at a range from 4.44 to 49.34 cents per mile, with the medium at 16.78 cents. For our model, this amounts to \$167.80 per 1000 mile run.

Regarding fuel consumption: “Vehicle fuel consumption increases approximately 30% under heavy congestion. Increased fuel consumption and air pollution costs represent about 17% of the total external cost of congestion.”

The report cites a Transportation Research Board special report “indicating that optimal congestion prices (which are considered to represent congestion costs) ranging from about 5 cents to 36 cent per vehicle mile on congested urban roads, with averages of 10 cents to 15 cents”.

The report concludes: “Viable estimates of total U.S. congestion costs range from \$43 to \$150 billion per year. Assuming that 20% of all driving and 80% of congestion costs occur under Urban Peak conditions, and 2,300 billion miles are driven annually, the average cost is about 17 cents per Urban Peak mile”

The Texas Transportation Institute in its Urban Mobility Report raises the question: “How Much More Road Construction Would Be Needed? They conclude as follows: “This analysis shows that it would be almost

impossible to attempt to maintain a constant congestion level with road construction only. Over the past 2 decades, only about 50 percent of the needed mileage was actually added. This means that it would require at least twice the level of current-day road expansion funding to attempt this road construction strategy. An even large problem would be to find suitable roads that can be widened, or areas where roads can be added. Year after year, most urban areas are pursuing a range of congestion management strategies, with road widening or construction being one of them.”

There have been several studies on the emissions from trucks, rail and barges. One was undertaken by this report’s author and reviewed by Oregon Department of Environmental Quality. The findings of September 4, 2002 are:

Eastman Data Emissions Comparisons

The following emissions comparisons have used the Eastman data of 59 miles as the number of miles one ton can be carried per gallon of fuel for truck, 202 miles for rail and 514 for inland barge.

HDDV (class 8B) Heavy heavy-duty diesel trucks (1):

HC	NOx	HC+NOx	CO	PM
1.3 g/bhp-hr	4.0 g/bhp-hr	5.3 g/bhp-hr	15.5 g/bhp-hr	0.10 g/bhp-hr
24.82 g/gal	76.38 g/gal	101.2 g/gal	295.98 g/gal	1.91 g/gal (c)

Freight Locomotive Emission Rates – Converted Emission Factors (g/gal) Line-Haul (2):

HC	NOx	HC+NOx	CO	PM
10 g/gal	270 g/gal	280 g/gal	26.6 g/gal	6.7 g/gal

USDA/FSMIP – Barging of Containerized Ag Products

Emission Standards for Commercial Marine Diesel Engines over 37 kW – 1.2 disp 5.0 (3):

HC+NOx	CO	PM
7.2 g/kW-hr	5.0 g/kW-hr	0.20 g/kW-hr
9.7 g/bhp-hr	6.71 g/bhp-hr	0.27 g/bhp-hr (b)
201.76 g/gal	139.36 g/gal	5.62 g/gal (d)

Table of Equivalent Emissions for One Ton-Mile (4):

	HC	NOx	HC+NOx	CO	PM
HDDV	0.42 g/t-m	1.29 g/t-m	1.71 g/t-m	5.02 g/t-m	0.03 g/t-m
Locomotive	0.05 g/t-m	1.34 g/t-m	1.39 g/t-m	0.13 g/t-m	0.03 g/t-m
Barge			0.39 g/t-m	0.27 g/t-m	0.01 g/t-m

Ratios Based on One Barge:

HDDV	4.38	18.59	3.00
Locomotive	3.56	0.48	3.00
One Barge	1.00	1.00	1.00

Ratios Based on 4-Barge Tow:

HDDV	17.52	74.36	12.00
Locomotive	14.24	1.92	12.00
4-Barge Tow	1.00	1.00	1.00

Hence it is concluded that a 4-Barge Tow is 18 times less in emissions for a new set of standards for non-methane hydrocarbons (HC) and nitrogen oxides (NOx) = HC+NOx than truck; 74 times less emissions for Carbon Monoxide; and 12 times less emissions for Particulate Matter. Stated in another way, a 4-Barge Tow emits only six percent of the emissions of truck regarding HC+NOx; one percent of the emissions of truck regarding CO and eight percent of the emissions of truck regarding PM for one ton-mile.

A 4-Barge Tow is 14 times less in emissions for a new set of standards for non-methane hydrocarbons (HC) and nitrogen oxides (NOx) = HC+NOx than rail; 2 times less

emissions for Carbon Monoxide; and 12 times less emissions for Particulate Matter. Stated in another way, a 4-Barge Tow emits only seven percent of the emissions of rail regarding HC+NOx; fifty-two percent of rail regarding CO and eight percent of the emissions of a truck regarding PM for one ton-mile.

It should be noted that the above emissions comparisons and conclusions are on a macro ton-mile basis and not on transport unit emissions comparison.

ODEQ and Eastman Data Emissions Comparison

The following emissions comparisons have used the ODEQ data of 163 miles as the number of miles one ton can be carried per gallon of fuel for truck, and Eastman data of 202 miles for rail and 514 for inland barge.

HDDV (class 8B) Heavy heavy-duty diesel trucks (1):

HC	NOx	HC+NOx	CO	PM
1.3 g/bhp-hr	4.0 g/bhp-hr	5.3 g/bhp-hr	15.5 g/bhp-hr	0.10 g/bhp-hr
24.82 g/gal	76.38 g/gal	101.2 g/gal	295.98 g/gal	1.91 g/gal (c)

Freight Locomotive Emission Rates – Converted Emission Factors (g/gal) Line-Haul (2):

HC	NOx	HC+NOx	CO	PM
10 g/gal	270 g/gal	280 g/gal	26.6 g/gal	6.7 g/gal

Emission Standards for Commercial Marine Diesel Engines over 37 kW – 1.2 disp 5.0 (3):

HC+NOx	CO	PM
7.2 g/kW-hr	5.0 g/kW-hr	0.20 g/kW-hr
9.7 g/bhp-hr	6.71 g/bhp-hr	0.27 g/bhp-hr (b)
201.76 g/gal	139.36 g/gal	5.62 g/gal (d)

USDA/FSMIP – Barging of Containerized Ag Products

Table of Equivalent Emissions for One Ton-Mile (5):

	HC	NOx	HC+NOx	CO	PM
HDDV	0.15 g/t-m	0.47 g/t-m	0.62 g/t-m	[1.82] g/t-m	[0.01] g/t-m
Locomotive	0.05 g/t-m	1.34 g/t-m	1.39 g/t-m	0.13 g/t-m	0.03 g/t-m
Barge			0.39 g/t-m	0.27 g/t-m	0.01 g/t-m

Ratios Based on One Barge:

HDDV		1.59	[6.74]	[1.00]
Locomotive:		3.56	0.48	3.00
One Barge		1.00	1.00	1.00

Ratios Based on 4-Barge Tow:

HDDV		6.36	[26.96]	[4.00]
Locomotive		14.24	1.92	12.00
4-Barge Tow		1.00	1.00	1.00

Hence it is concluded that a 4-Barge Tow is six times less in emissions for a new set of standards for non-methane hydrocarbons (HC) and nitrogen oxides (NOx) = HC+NOx than truck; [27] times less emissions for Carbon Monoxide; and [4] times less emissions for Particulate Matter. Stated in another way, a 4-Barge Tow emits only sixteen percent of the emissions of a truck regarding HC+NOx; [four] percent of the emissions of a truck regarding CO and [25] percent of the emissions of a truck regarding PM for one ton-mile.

A 4-Barge Tow is 14 times less in emissions for a new set of standards for non-methane hydrocarbons (HC) and nitrogen oxides (NOx) = HC+NOx than rail; 2 times less emissions for Carbon Monoxide; and 12 times less emissions for Particulate Matter. Stated in another way, a 4-Barge Tow emits only seven percent of the emissions of rail regarding HC+NOx; fifty-two percent of rail regarding CO and eight percent of the emissions of a truck regarding PM for one ton-mile.

It should be noted that the above emissions comparisons and conclusions are on a macro ton-mile basis and not on transport unit emissions comparison.

(1) USEPA, Air and Radiation, EPA420-R-99-010, April 1999, Update of Heavy-Duty Emission Levels (Model Years 1988-2004+) for Use in MOBILE6, Page 4 and 5. The 2004 combined emission standard for NOx and NMHC is 2.5 g/bhp-hr per ODEQ. The factors herein used are for 1998-2003.

(2) USEPA, Air and Radiation, EPA420-F-97-051, December 1997, Technical Highlights, Emission Factors for Locomotives, Page 2

(3) EPA, 40 CFR 94, Control of Emissions From Nonroad Large Spark Ignition Engines, Recreational Engines (Marine and Land-Based), and Highway Motorcycles, Table V-1. – Emission Standards for Commercial marine Diesel Engines over 37 kW.

(4) Pacific Northwest Waterways Association, Benefits of the Columbia-Snake River System, River Navigation, July 2002, Page 1. Number of Miles One Ton Can be Carried Per Gallon of Fuel based on Eastman, S.E., Fuel Efficiency in Freight Transportation, The American Waterway Operators, Inc., Arlington, VA, June, 1980, p.7.

(5) ODEQ suggested a more appropriate number of miles is 163 as the number of miles one ton can be carried per gallon of fuel for truck.

(a) Conversion to Gram per Gallon Emission Factor = 20.8 bhp-hr/gal See (2) preceding

(b) Conversion is 1.0000 g/bhp-hr = 1.3410 g/kW-hr per EPA email of 7/30/02

(c) Conversion to Gram per Gallon Emission Factor = 19.0953 bhp-hr/gal. USEPA, Air and Radiation, EPA420-R-02-005, January 2002, Update Heavy-Duty Engine Emission Conversion Factors for MOBILE6

(d) Conversion factor of 20.8 bhp-hr/gal used because many towboats have used locomotive diesel power plants. See EPA email of 7/30/02

For the model, 5,804,894 pounds of emissions annually will be avoided with weekly-containerized common carrier barge service. For the estimated 33,000,000 persons living along the route of the trucks in Oregon and California, it means 2.852 ounces less in the lungs or about the weight of 17 pages of 20-pound bond paper.

It should be noted that ExpressBarge, a weekly container-on-barge shuttle from New York harbor to Albany, is being subsidized with a \$3.3 million grant under the federal Congestion Mitigation Air Quality program for its first two years of operation. The Port Authority of New York and New Jersey is contributing another \$1.2 million that is being used to pay a fee

of \$25 for each full container that the service carries from the port. In addition, the New York Shipping Association has waived its assessment of \$105 per container on each container transshipped via ExpressBarge. The port authority and the Port of Albany have agreed to seek additional funding for subsidies after the CMAQ grant expires in April 2005 and are in discussions with the Maritime Administration.

¹ European Commission, “White Paper – European Transport Policy for 2010” Time to Decide, Office for Official Publications of the European Communities, Luxembourg

12 Industrial Sites

The coastline of the Pacific Ocean parallels Interstate 5 from Mexico to Canada. Thence continuing on to Alaska with an approximate parallel to the ALCAN Highway.

Inland bays and rivers provide a littoral beyond the coast line; known to most readers are Puget Sound, Columbia/Snake Rivers, San Francisco Bay, and Sacramento River.

States and local governments have industry recruitment teams to entice relocations to their jurisdictions. Incentives may include installation of utilities such as water and sewer and often access roads. Sites may be made available at reduced cost or near gratis.

Some States classify industrial sites such as “Shovel-ready” defined as “land on which construction can begin immediately after obtaining building permits.” Or “Project-ready” defined as “land that can be made ready for construction to begin within six months, meaning that some basic infrastructure needs to be provided before construction starts . . .” . Priority is often assigned to economically depressed communities where labor force training may be subsidized.

Previously mentioned in this report is the difference between modal strategic planning in the European Union compared to the U.S. We have compartmentalized the user fees into trust funds whereas the EU members may reallocate to enhance “sustainable transportation development”. The use of trust funds almost insures greater congestion in highway freight movement because as roads, highways and interstates are rehabilitated and modernized (more/wider lanes, removal of curves, etc.) industry locates along the highways.

Under this scenario, it takes an environmentally strong local government to assess whether the industrial relocation is beneficial to the community when external costs are clearly identified. A recent example will be used. Adjacent to Interstate 5 south of Portland some 15 miles, a golf course conversion to a distribution center was rejected by the local community. The golf course does not have rail within a mile nor is it located near a navigable waterway. A rail spur line would have to cross Interstate 5 through developed subdivisions. Truck traffic on Interstate 5 would

increase as trailers and containers would move through the narrow cuts to the Port of Portland. Analogous to Seattle's hourglass shape, Portland traffic flow is constrained by its geography consisting of the confluence of two rivers.

With the amount of sites along the Columbia River for 106.5 miles from the mouth at Astoria to Portland and the stretch of 170 miles to Boardman, 187 miles to Umatilla and the 360 miles to Lewiston, Idaho, it is advocated that industrial site priority for public funds consider a waterway location as a critical priority criteria. Of course, water and rail access would be the highest priority.

Industries locating at waterway access have the opportunity to develop a private dock and the ability to load containers and trailers to maximum capacity without movement on public roads. Also private docks provide for labor productivity flexibility. Shuttle barges can move containers to a marshalling dock for onward ocean barge movement, which would connect to major ports thence world markets.

Communities in jeopardy of losing rail service from washouts or deterioration of short line trestles without funds for replacement can consider railcar on barge service to preserve their industrial base. Rail barges have been used for decades, moving Alaska Railroad cars between Seattle and Whittier, Alaska. The most known being the Hydro Train. The rail docks are more costly than RO-RO ramps but the technology is proven.

Ocean deck barges can hold 40 to 48 railcars. The movement of tug and single barge would approximate \$700 per car on a round trip basis, but would be reduced by the previously incurred short line rate which can be as much as \$400 per car.

Not only would increased highway congestion (resulting from loss of traditional rail service) be eliminated, the reliability of delivery by water to major rail terminals (such as T-6 at the Port of Portland) would provide rapid connect to Class I carriers giving access to all major cities in the U.S.

The community would avoid the social and financial costs of unemployment from maintaining the industry. Unemployment benefits, near \$400 per week, for a plant employing 100, would be the equivalent

of \$265 per car. Thus the sum of the previously incurred short line rate to connect with Class I railroads (\$400) and the application of a proxy for unemployment benefits (\$265), makes rail barge a viable option for communities facing loss of rail service.

In the Report of the Governor's Industrial Lands Task Force, October 2003 it is stated in the section of Infrastructure Financing: "The plight of the state's transportation infrastructure is well documented and is the subject of considerable legislative focus during the current session. Since ODOT's roads carry over 80% of the vehicle miles traveled in the state, it is critical that these facilities be maintained and expanded as needed."

None of the recommendations include port development and the subsequent waterways usage as a policy instrument of the state's encouragement of developing and marketing "Project-ready" industrial lands. At page 12 the report states regarding a lack of Project-Ready Industrial Lands: "Other areas, however, such as Portland metro, Salem-Keizer, Eugene-Springfield, Bend and Pendleton, appear to have short-term and in many cases long-term (20-year) supply shortages."

13 Shipper's Association

USDA Shipper and Exporter Assistance, Transportation and Marketing, Agricultural Marketing Service has provided a wealth of information on Shipper's Association; the following information is from their website:

A shipper's association is defined by the American Institute of Shippers' Association as:

"Non-profit membership cooperatives which make domestic or international arrangements for the movement of members' cargo. They are a means by which the small and medium sized shipper, and even the large shipper, can obtain economies of scale without the markups charged by other transportation intermediaries who perform consolidation services in order to obtain volume discounts."

Shippers' associations allow multiple shippers to pool their volumes in order to increase shipment volumes. With a larger shipment volume, the shippers' association can negotiate volume discounts or service contracts with ocean carriers on behalf of its members. Shippers' associations, unlike non-vessel-operating common carriers (NVOCC's), which are regulated under the new shipping act, are able to maintain confidentiality in their contracts.

Services Offered and Benefits of Membership to Shippers' Associations:

Because of the new shipping act, many more shippers' associations are being formed as "rate negotiators." Rate negotiating shippers' associations negotiate for volume discounts and may also make transportation arrangements for the shipment. However, "rate negotiating" shippers' associations often do not manage other transportation or logistical arrangements. Another benefit is that since the new shipping act will allow shippers' associations to keep service contracts confidential, shippers wishing to keep such costs concealed will find that membership in a shippers' association is a means of doing so."

Larger shippers' associations are able to reduce the amount of cargo transshipped to less frequented destinations due to consolidated shipments. Often a small shipment bound for a minor port is shipped

along with cargo destined for a major port. Upon arrival at such ports, the cargo is separated and redirected to its final destination. With larger shipments moving to less visited ports consolidated by shipping associations, there will be a reduced need for transshipping. This reduction in transshipment can result in lower costs and less damage, as well as faster transit times.

In large volume rate negotiating for service contracts, shippers' associations can negotiate for improved terms of service, in addition to better rates. This is important when trying to secure space and equipment for busy trade lanes, where ensuring better service can be difficult. Also, shippers' associations, which are able to provide volume movements in multiple trade lanes, as well as movements in both directions of the same trade lane, will achieve lower rate discounts and better service since carriers will be more eager to negotiate with them. Some associations offer consolidation or "consignment of cargo which is insufficient to fill a shipping container" (Brodie, 1994), also known as LCL or LTL, "less than container load." LCL is a useful service for smaller shippers unable to fill an ocean-shipping container with their cargo. Some shippers' associations offer marine cargo insurance, as well.

Possible Disadvantages of Membership in a Shippers' Association:

There are considerations that should be taken into account by some shippers before joining a shippers' association. As a member, shippers' can be required to guarantee a certain volume of their shipments in order to receive the benefits of the reduced rates obtained by the service contract between the association and the ocean carrier. This can be a disadvantage to larger shippers able to receive comparable or better rates outside of the shippers' association. In this case, most likely, the large shipper will be able to pull its freight from the association--the only consequence being a loss of membership with the association. However, members are often not required to sign such contracts.

It has also been reported that in the past, shipping lines, especially ocean liner conferences, avoid dealing with shippers' associations by creating false barriers, such as requiring a list of membership within the contract. However, historically independent carriers tend to be less hesitant to deal with shippers' associations than conference carriers. Congress has

specifically prohibited conferences and carriers from discriminating against shippers' associations; nonetheless, it is hard to prove such discrimination and, therefore, hard to penalize. If this does become an issue, shippers' associations maintain the option of using a freight forwarder to receive good rates.

As a way around working with associations, shipping lines may approach individual shippers within associations to offer them confidential deals and lower rates. This can result in a shipper or shippers, often the ones providing the majority of freight, leaving the association. This may make the shippers' association less able to meet the minimum volume amounts negotiated in the service contract or make it difficult for the association to negotiate lower rates with carriers. To prevent this from happening, shippers may benefit by joining an association with members having similar volumes.

Many shippers of specific products express concern about not wanting to join shippers' associations with shippers of the same or similar product to ensure that they are not "helping the competition" receive reduced rates for export. As a result, some shippers' associations may limit membership to shippers of commodities not currently represented by their members. This is up to the membership policy agreed upon by the individual shippers' association.

Legalities of Shippers' Associations:

Shippers' associations are recognized by the law as a separate legal entity in international trade; however, they are not bonded, regulated, or licensed under existing regulations or the new Ocean Shipping Reform Act. As a separate legal entity, shippers' associations can enter into and utilize volume service contracts, are entitled to utilize tariff rates, and may negotiate time/volume and loyalty contracts. Shippers' associations are not common carriers. They serve members, not the general public, and are, therefore, not required to file tariffs or publish rates. This means that shippers' associations do not have exposure to antitrust laws, so they are able to maintain confidentiality of sensitive competitive business information. Shipper's associations are legally shippers and are entitled to all the rights and privileges of other shippers. The Federal Maritime Commission and maritime lawmakers have maintained that the activities of shippers' associations will not be regulated. Also, membership of

shippers' associations is not limited by law, which means that even tariffed and bonded NVOCC's may belong. The number of members, which is also not regulated, may range from two to thousands. Membership guidelines are developed by the individual shippers' associations.

The following is a list from the USDA website:

Directory of Shippers' Associations for Agricultural Shippers:

AgSA (Agriculture Shippers' Association)

Peter Friedman
9th Floor
1275 Pennsylvania Avenue, NW
Washington, DC 20004
Telephone: (202) 467-8383
Facsimile: (202) 467-8381
E-mail: OurManInDC@aol.com
Kathryn Beubien
3245 Clay Street #3
San Francisco, CA 94115
Telephone: (415) 292-6222
Facsimile: (415) 292-6333
E-mail: AgOTC@aol.com

Food Shippers Association of North America

Bob Weiss
13240 Northup Way, #14
Bellevue, WA 98015
Telephone: (425) 649-0555
Facsimile: (425) 643-5222
E-mail: bobweiss@fsana.org and aprilthanos@fsana.org
Website: www.fsana.org
Dry and Refrigerated containers;
inbound & outbound cargo

International Shippers' Association

Armen Derderian
1250 Sixth Avenue, Suite 209
San Diego, CA 92101
Telephone: (404) 766-7144
Facsimile: (404) 766-7767
Website:
www.wtic.net/isa/index.html

MIATCO (Mid-America Agri-Trade Council)

Timothy Hamilton/Tom Taylor
400 West Erie Street, Suite 100
Chicago, IL 60610
Telephone: (312) 944-3030
Facsimile: (312) 944-1144
E-mail: miatco1@miatco.org
Services Offered: Consolidation

**Minnesota Shippers
Association**

852 Grain Exchange
400 South 4th Street
Minneapolis, MN 55415
Telephone: (612) 252-1453
Facsimile: (612) 339-5673
Email: info@mnshippers.org
Website: www.mnshippers.org

**NCBFAA (National Customs
Brokers and Forwarders
Association of America)**

1200 9th Street, NW, Suite 901
Washington, DC 20036
Telephone: (202) 466-0222
Facsimile: (202) 466-0226
E-mail: staff@ncbfaa.org
Website: www.ncbfaa.org

**NUSA (National Unaffiliated
Shippers' Association)**

Tom O'Rourke
Website: www.nusa.net

**North American Shippers
Association, Inc.**

Eric Whitman
PO Box 249
1600 St. Georges Avenue
Rahway, NJ 07065
Telephone: (732) 388-6256 and
(800) 524-1186
Facsimile: (732) 388-6580
E-mail: nasaships@aol.com
Website: www.nasaships.com
Consolidation, marine cargo
insurance, logistics provider to
alcoholic beverage industry

**North Atlantic Alliance
Association (NAAA)**

Joseph T. Saggese
Executive Director
10th Floor
1710 Rhode Island Avenue, NW
Washington, DC 20036
Telephone: (202) 293-3300
Facsimile (202) 29303307
E-mail: jsaggese@transportlaw.net,
Ashley Craig, Assistant Managing
Director, acraig@rofgw.com
Carlos Rodriguez, Legal Counsel,
rodriguez@rofgw.com
Website: www.naaai.com

**Refrigerated Shipping
Association™**

Palle B. Mathiesen or
Angie M. Brown
537 Newport Center Drive #313
Newport Beach, CA 92660
Telephone: (949) 720-0942
Facsimile: (949) 720-0943
E-mail:
MAT.MMS@worldnet.att.net

**Streamline Shippers'
Association, Inc.**

Timothy Horton
PO Box 513606 (Mail)
Los Angeles, CA 90051-1606
5525 Santa Fe Avenue (Street)
Vernon, CA 90058
Tel: (213) 588-9100, ext. 320
Facsimile: (213) 582-3424
E-mail: tim@ssa.internet-
enterprise.com
Website:
www.streamlineshippers.com

**U.S. Dairy Export Shippers
Association, Inc.**

Debbie Crowe
Suite 609
11258 Cornell Park Drive
Cincinnati, OH 45242
Telephone: (513) 489-8903
Facsimile: (513) 489-8902
E-mail: usdesa@earthlink.net or
dcrowex@aol.com
Website: www.usdesa.org
Services: Marine cargo insurance

**Wine & Spirits Shippers'
Association**

Geoffrey N. Giovanetti
Managing Director
Suite 332
11800 Sunrise Valley Drive
Reston, VA 20191-5396
Telephone: (800) 368-3167; (703)
860-2300
Facsimile: (703) 860-2422
E-mail: info@wssa.com
Website: www.wssa.com
Services Offered: Marine cargo
insurance, Consolidation

The Food Shippers Association of North America has been kind to provide information on their association for the benefit of readers of this report to understand how a shipper's association could be the foundation for inland and ocean barging:

FOOD SHIPPERS ASSOCIATION OF NORTH AMERICA

13240 Northup Way, #14 Bellevue, WA 98005

Phone: 425-649-0555 Fax: 425-643-5222

HISTORY AND BACKGROUND

Federal regulations state that exporters and importers, even direct competitors, can combine together in a 'not for profit' company called a shippers associations and use their combined volume to negotiate freight discounts. Such an organization must be run by an independent administrator, a person who is neither employed by nor affiliated with any of the members. This ensures confidentiality of all information supplied by members for rate negotiations and that the organization operates for the benefit of all of its members.

The FSANA as it exists today is a combination of two shippers associations. The Northwest Refrigerated Shippers Association (NRSA) was formed in August 1996 by three large apple exporters. At that time, they chose not to actively seek new members. They contracted with Robert Weiss to act as their Independent Administrator and signed their first contract in November 1996. In December 1996 Mr. Weiss contacted a number of French fry exporters and four of them formed the Food Shippers Association of North America. The FSANA has steadily added members and expanded its contracts. It now has over 75 members and 17 service contracts with rates to and from Asia, Middle East, Europe, and South America, and Africa, as well as foreign to foreign rates.

The Association provides members with the industry's lowest rates while at the same time eliminating any risk because we no longer require commitments from our members. Joining the FSANA does not change the way our members do business. They continue to use their current freight forwarders and maintain direct contact with carriers.

We are confident that our shippers association can save you time and money, increase your choices of carriers, and eliminate risk; all without changing the way you do business. For more than seven years, the FSANA has offered it's more than 85 member-owners the advantage of combining their volume of more than 5,000 containers in 17 contracts with steamship lines servicing every major origin and destination.

Membership offers the following benefits:

1. LOWEST POSSIBLE RATES

- lower your transportation costs to increase profits and sales volume
- our rates often match those of the largest shippers in any given commodity
- we keep our rates competitive through ongoing market research and constant renegotiation
- rate updates once a month

2. SAVES YOU LOTS OF TIME

- we negotiate rates and contracts on your behalf
- many rates already in place

3. MANY BENEFITS FROM OUR MULTIPLE CONTRACTS

- being a part of much larger contracts often improves service
- wider choice of carriers to fit your schedule as well as equipment and delivery needs
- bid process keeps rates at most competitive level
- continuous improvement in service commitments from our carriers

4. NO CHANGE FROM THE WAY YOU DO BUSINESS NOW

- maintain direct contact with carriers
- continue to use your freight forwarder
- only change to use our contract number when making a booking

5. MEMBERSHIP IS RISK FREE

- no commitment required from individual members
- big minimum volume commitments spread over many members
- large variety of commodities insures contract commitments fulfilled
- your business information remains confidential

6. LOW COST

- we do not mark up our rates
- one-time only joining fee of \$500
- small transaction charges for shipments under Association contracts: 20' dry: \$15,
40' dry and 20' reefer: \$25, 40' reefer: \$35

I. Membership Fee

The member agrees to remit a joining fee of \$500 to the Association. The payment is due upon submission of the Member's application. The amount shall be refunded to the Member if the application is declined.

II. Transaction Charges

Each shipment shall be subject to a transaction fee of \$35 per 40' refrigerated container, \$25 per 45" & 40' dry container and 20' refrigerated container, and \$15 per 20' dry container to be paid by the Member for all shipments made under service contracts negotiated by the Independent Administrator on behalf of the FSANA and shipments using rates obtained through the Independent Administrator.

Monthly statements indicating bill of lading number and total number of containers shipped will be sent to each Member at the end of each month. Payment for said bill must be paid by the member and received by the Association by the 15th day of the following month

III. Compliance with Procedures

The Member agrees to comply with the following documentation procedures of the Association:

1. In order to apply service contract rates of the carrier, all Bills of Lading must include the Associations contract number or any other specified identification number for tracking purposes.

2. The Member, its designated representative, or its freight forwarder must provide the Association with copies of all Bills of Lading shipped under association contract. In lieu of a Bill of Lading, the member or its representative must supply the following information for each shipment:

- 1) Bill of Lading No.
- 2) Sail Date
- 3) Port of Loading
- 4) Port of Destination
- 5) Commodity
- 6) No. of containers with carton count for each
- 7) Booking number
- 8) Container No.

3. All such information provided to the Association by the member will be kept in the strictest confidence by the Association and its Independent Administrators and will not be disclosed to any third party including other members of the association without the express written consent of the member.

IV. Cancellation

This agreement shall remain in effect until canceled by the Association or the Member on thirty (30) days written notice by either party.

14 Cargo Growth Forecast for West Coast

The U.S. Department of Transportation Freight Analysis Framework estimates freight growth from 1998 to 2010 to 2020 by mode. Their estimate by tons (millions):

	1998	2010	2020	
Total	15,271	21,376	25,848	
Domestic	13,484	18,820	22,537	
Air	9	18	26	
Highway	10,439	14,930	18,130	2010/1998 = 43% growth
Rail	1,954	2,528	2,894	
Water	1,082	1,345	1,487	
International	1,787	2,556	3,311	
Air	9	16	24	
Highway	419	733	1069	
Rail	358	518	699	
Water	136	199	260	
Domestic & International Highway	10,858	15,663	19,199	2010/1998 = 44% growth; about 3.0% per year

Their narrative is that the nation's highway system and enormous truck fleet, moved 71 percent of the total tonnage. Domestic freight volumes will grow by more than 65 percent, increasing from 13.5 billion tons in 1998 to 22.5 billion tons in 2020. The forecast shows that the air and truck modes will experience the fastest growth. Trucks are expected to move over 75 percent more tons in 2020, capturing a somewhat larger share of total tonnage. International trade is forecast to grow faster than domestic trade.

One indication of truck growth is measuring the Average Daily Truck Volumes, Interstate Highways in Oregon, ODOT. Measurements have been taken south of Ashland, Oregon near the California border. In 1990 there were 3702 trucks daily in both directions; in 1996 there were 4699 and in

2002 there were 6687. Ashland is a good indicator of through or “bridge” traffic since little industrial activity is in the area.

The ODOT count is of all trucks, not necessarily five axle. For estimation purposes, a truckload of 50,000 lbs. is used. If 75% of the 6687 daily count was five axle or more then the flow would be 17,554 trucks per week with a payload of 50,000 lbs. both northbound and southbound directions. Since a truck is approximately a FEU we see that 600 FEU via barge in either northbound or southbound comes from a fairly large tonnage pool. Even if 25% of the 6687 daily count were used, there would be 5,851 truckloads/FEU per week northbound and southbound to draw from.

The growth from 1996 (4699 daily total count) to 2002 (6687) was 42.3 percent or approximately 6.0% per year. Please see Attachment XX for data.

Interstate 5 is a major north-south corridor and the West Coast is a growing region, hence we would expect Interstate 5 volume to increase at least as much as the national average. Applying a approximate 3.0% growth rate from U.S. DOT above to a five axle truckload count of half at Ashland (11,702 in each direction per week) in 2005 it will reach 12,787 weekly in both northbound and southbound directions.

Since this report is about capturing the growth in freight movements and a modal shift from highway to water, the volume of new freight is sufficient at half of the counts at Ashland; $12,787 - 11,702 = 1,085$ new directional truckloads/FEU weekly. It is more than sufficient if the Interstate 5 growth rate from 1996 to 2002 is sustained at 6%: $13,937 - 11,702 = 2,235$ new directional truckloads/FEU weekly.

Factoring In Rail To Highway or Water Modal Shift.

The following information is drawn from Cambridge Systematics Freight Rail and the Oregon Economy prepared for the Port of Portland concerning the Klamath Corridor: “The West Coast rail corridor extends 1,200 miles north-south, paralleling I-5, and linking Seattle, Portland and Southern Oregon to the Bay Area, Los Angeles and San Diego. Food, lumber, wood and paper products, primary metals and farm products are the primary commodities moving along the corridor. Rail capacity is

constrained because of the mountainous terrain. By 2020 freight flows in the West Coast corridor are forecast to reach 57 million tons . . . Of this, 69 percent of tonnage . . . will be carried by truck; 31 percent of tonnage will be carried by rail – if the capacity exists. Oregon needs improved West Coast rail corridor service to reach the large and lucrative Southern California markets and to keep down the cost of food and goods brought north to supply the growing population and industry of the Pacific Northwest. This will require coordinated improvements to rail capacity in the Portland Triangle, the Willamette Valley corridor and the Klamath gateway in Southern Oregon.”

The report describes the I-5 corridor: “There are numerous choke points along the West Coast rail corridor; however, highway capacity along the I-5 corridor is even more constrained than rail capacity. I-5 is one of the nation’s most heavily used routes for both automobile and truck traffic. Absent improvements, the Federal Highway Administration estimates that by 2020 traffic on I-5 could operate at level of service E and F (e.g., stop-and-go) for many hours a day for virtually the entire distance between San Diego and the Bay Area, as well as through the Portland and Seattle-Tacoma metropolitan regions.”

One million tons growth (of the total 57 million tons cited) equates to 385 truckloads/FEU weekly northbound and southbound, which if cannot be rail freight then a modal shift in growth to either truck or barge. The 57 million tons projection for 2020 equates to 21,923 truckloads/FEU weekly in both a northbound and southbound direction.

It should also be noted that U.S. Highway 97 from the Washington State border to the California border will also have freight volume growth. The present volume is not included in the Ashland truck counts.

15 Freight Flows

From the Bureau of Transportation Statistics, the freight flows along the West Coast based on 1997 State-to-State Commodity Flows (Multimodal):

To California	30,999,000 tons	1,239,960	Truck Loads @ 25 ST
From Washington	9,137,000 tons	365,480	
From Oregon	9,988,000 tons	399,520	
From Idaho	1,141,000 tons	45,640	
From Montana	1,073,000 tons	42,920	
From California	13,446,000 tons	537,840	T/L
To Washington	5,638,000 tons	225,520	
To Oregon	6,810,000 tons	272,400	
To Idaho	625,000 tons	25,000	
To Montana	373,000 tons	14,920	
To Alaska	2,748,000 tons	109,920	T/L (1)
From Washington	2,446,000 tons	97,840	
From Oregon	171,000 tons	6,840	
From California	131,000 tons	5,240	
To Hawaii	1,553,000 tons	62,120	T/L (2)
From Washington	206,000 tons	8,240	
From Oregon	220,000 tons	8,800	
From California	1,127,000 tons	45,080	

(1) Alaska is served by Horizon Container Lines, TOTE RO-RO and Container Line, Alaska Marine Lines, Northland Tug and Barge, Sampson Tug and Barge and Crowley Marine

(2) Hawaii is served by Horizon Container Lines, Matson Navigation, Northland Services Marine Transportation and Sause Bros. Tug and Barge

On a macro basis, the multimodal freight flow from the Pacific Northwest to California and from California to the Pacific Northwest is 44,445,000

tons which is equivalent to 1,777,800 truckloads if each truck carries 50,000 pounds.

Comparing the flow to Alaska at 109,920 truckloads, the West Coast freight available is sixteen times. It should be noted that Alaska is served with five water carriers and the Alaskan Highway. Compared to Hawaii it is 28 times, noting that Hawaii is served by three water carriers. Although these two states are dependent upon water transport from the U.S. it should be noted they are served by foreign flag carriers, hence the total freight flows to and from Alaska and Hawaii are understated in the data.

Again on a macro basis, the freight flow from the Pacific Northwest to California and reverse is equivalent to 2963 double tow ocean deck barges each carrying 300 FEU of 25 ST per FEU. On a weekly basis there would be 57 tows.

The plan for implementation of weekly containerized common carrier service requires 104 double tows annually or 2 per week (1 each direction).

16 Ocean Tug and Barge Companies

MARAD lists the following ocean tug and barge companies in the U.S. Flag Carriers Fleet:

Columbia Coastal Transport
106 Allen Road
Liberty Corners, NJ 07938

Seabulk Towing
2200 Ellen Drive
Ft. Lauderdale, FL 33316

Crowley Maritime
155 Grand Avenue
Oakland, California 94612

Signet Maritime Corporation
FM 2725 and Garnett Road
Ingleside, TX 78362-1903

Foss Maritime Company
660 W. Ewing Street
Seattle, WA 98119

Tidewater, Inc.
601 Poydras Street
Suite 1900
New Orleans, LA 70130

K-Sea Transportation
3245 Richmond Terrance
Staten Island, New York 103003

TECO Transport
702 N. Franklin Street, Plaza 9
Tampa, FL 33602

Maybank Shipping Company, Inc.
525 East Bay Street, Suite 200
Charleston, SC 29403

Trailer Bridge, Inc.
10405 New Berlin Road East
Jacksonville, FL 32226

Moby Marine
219 Fisherman's Wharf
Fort Pierce, FL 34950

Moran Towing Company
50 Locust Avenue
New Canaan, CT 06840

Northland Services, Inc.
6700 W. Marginal Way SW
Seattle, WA 98106

The ocean tug and barge companies serving the West Coast of the Pacific are:

Alaska Marine Lines, Inc.
5615 W. Marginal Way SW
Seattle, WA 98124

Seaspan International, Ltd.
10 Pemberton Avenue
North Vancouver, BC

Brusco Tug & Barge
548 14th
Longview, WA 98632

Sause Bros,
155 East Market Avenue
Coos Bay, Oregon 97420

Crowley Maritime
155 Grand Avenue
Oakland, California 94612

Western Towboat
617 NW 40th
Seattle, WA 98107

Dunlap Towing Company
617 N. First Street
La Conner, WA 98257

Foss Maritime Company
660 W. Ewing Street
Seattle, WA 98119

Harley Marine Services/Olympic
Tug & Barge
910 SW Spokane Street
Seattle, WA 98134

Island Tug & Barge
PO Box 84664
Seattle, WA 98124

Northland Services, Inc.
6700 W. Marginal Way SW
Seattle, WA 98106

Sampson Tug & Barge Company,
Inc.
7400 8th Avenue South
Seattle, WA 98108

The inland towboat companies of the Columbia/Snake River System are:

Bernert Barge Lines
421 High Street, Suite 108
Oregon City, OR 97045

Brusco Tug & Barge
548 14th
Longview, WA 98632

Foss Maritime Company
660 W. Ewing Street
Seattle, WA 98119

Harley Marine Services/Olympic Tug & Barge
910 SW Spokane Street
Seattle, WA 98134

Shaver Transportation Co.
4900 N.W. Front Avenue
Portland, Oregon 97210

Tidewater Barge Lines, Inc.
PO Box 1210
Vancouver, WA 98666